DOCUMENT RESUME

ED 225 110 CS 006 950

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TITLE A Descriptive Study on the Reading Comprehension and Related Characteristics of U.S. Navy Recruits: A Twelve-Month Profile.
PUB DATE Nov 82
NOTE 21p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (11th, New Orleans, LA, November 10-12, 1982).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Comparative Analysis; *Educational Attainment; Individual Characteristics; *Military Personnel; *Reading Ability; *Reading Comprehension; *Reading Research
IDENTIFIERS *Navy

ABSTRACT

To determine the educationally related characteristics and relationships among selected variables that describe the United States Navy's recruit population, data were obtained on 84,123 recruits who entered the Navy between June 1981 and May 1982. Data were obtained from the Gates-MacGinitie Reading Comprehension Test and the Armed Forces Qualification Test of the Armed Services Vocational Aptitude Battery. Selected variables included years of education, high school graduation status, aptitude test scores, and reading grade level (RGL) scores. Results indicated that with respect to years of education, Navy recruits had completed slightly more than half of the 11th grade on the average. The aptitude of recruits did not appear to vary in any clearly identifiable season or cyclic pattern. The performance of the recruits on reading comprehension showed relative stability across the 12-month period with regard to descriptive measures of central tendency. The conclusions suggest that the recruit population remains relatively stable with respect to central tendency measures on years of education, reading comprehension performance, and aptitude indices. Factors on which distributions by month differed included RGL scores, high school graduation status, high school graduate and nonhigh school graduate recruits who scored above and below the 6.0 RGL criterion, and high school graduation status of recruits who scored below the 6.0 RGL. (HOD)

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A DESCRIPTIVE STUDY ON THE READING COMPREHENSIO. AND RELATED CHARACTERISTICS OF U.S. NAVY RECRUITS: A TWELVE-MONTH PROFILE

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CS206250

Paper presented at the Eleventh Annual Meeting of the Mid-South Educational Research Association in New Orleans, Louisiana, November 10-12, 1982

Introduction

The Department of the Navy has officially recognized the need for remedial training in basic educational skills among some personnel as a requirement to achieve its mission. The statement of policy is presented in Instruction 1510.3 that was issued by the Secretary of the Navy on 2 June 1978 (9). The Instruction states that "It is the policy of the Department of the Navy to provide, when indicated, on-duty remedial job-relevant basic skills training in order to fill personnel requirements" (9:1). Job-relevant basic skills are defined as "those capabilities prerequisite to efficient completion of Navy training programs, adequate job performance and career advancement. Notable among these are literacy, study and computational skills" (9:1).

The Navy has developed several fundamental skills training programs as a result of implementing its policy. One of the programs, Academic Remedial Training (ART), is a basic reading and verbal skills program conducted at Recruit Training Centers that is designed to provide essential language skills needed by recruits to complete the academic requirements of recruit training. The ART Program was officially established as a remedial reading course for recruits in 1967 and became operational immediately at the Navy's three Recruit Training Centers. Since the staff at each site was autonomous with respect to the choice of curriculum and testing plan for the program, three independent programs emerged under the rubric of the ART Program.

In 1978, standardization of the reading curriculum and the testing procedures used in the program was instituted by the Chief of Naval Technical Training (4). A verbal skills component that places emphasis on listening and speaking skills was added to the program at two recruit training centers (Orlando and San Diego) in 1981 (5). Historically, the singular purpose of ART has been to assist recruits in acquiring the reading skills required to complete basic training successfully. While the ultimate purpose remains the same, the addition of the verbal skills component to the program has expanded the scope of remediation to include listening and speaking skills of recruits who speak English as a second language.

The implementation of the standardized ART reading curriculum introduced a requirement that a Computer-Managed Instruction (CMI) system would be used to perform test scoring functions and to maintain records on test performance by recruits. The CMI system scores the tests employed in the screening, diagnostic, and criterion performance aspects of the reading component. Monthly CMI reports on the educational and reading characteristics of the total recruit accessions are prepared routinely from the records maintained in the system.

Problem

The problem addressed by this study was to determine the educationally related characteristics and relationships among selected variables that describe the Navy's recruit population. The investigation of the problem utilized the recruits who entered the Navy between June, 1981, and May, 1982, as the sample of subjects. The primary performance variable of interest was the grade level score on reading comprehension. Other variables that were employed included years of education, aptitude score, and high school graduation status. Month of entry into the Navy was used as a classificatory variable.

In addition to the descriptive analyses on some variables, six null hypotheses were formulated to test for statistically significant differences among recruit sub-populations on selected variables. The hypotheses that were tested were the following:

1. There are no differences in the distributions of recruits classified by reading grade level (RGL) category and month of entry into the Navy.

2. There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy.

3. There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.

4. There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.

5. There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy.

6 There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

The .05 level of significance was used in testing the hypotheses.

The study is significant in two respects. First, the data and analyses could reveal factors on which the recruit population varies during a twelve-month period. Such information would enable ART management personnel to allocate and utilize resources (e.g. staff, facilities, and instructional equipment) more efficiently in operating the program. Variability in the numbers and characteristics of recruits needing reading remediation over a twelve-month period has implications for staffing and instruction. Second, the study could demonstrate potential uses of CMI system data for program monitoring and management. Since these data are reported routinely, it is possible for management personnel to use them in making decisions about program plans and operations.

Related Research

Reading skill levels of Navy personnel have been the subject of inquiry by researchers because of the importance of reading skills for success in training and job performance. Hoiberg, Hysham, and Berry (7) found that reading skills of recruits are related significantly to successful completion of the first enlistment term in the Navy. Biersner (1) reported that many Navy training manuals require reading skills at the 12th grade level or higher. Zierdt (11)concluded that the reading abilities of many recruits do not meet the skill requirements of widely used Navy materials.

Studies have been conducted to describe the reading skill level of the recruit population based on the Gates-MacGinitie Reading Tests. Duffy and Nugent (6) reported a median RGL of 11.9 on comprehension for 31,575 recruits testing at the Recruit Training Center in San Diego between May, 1974, and May, 1975. The data indicated that 2.8 percent scored below the 4.0 RGL and 9.6 percent scored below the 6.0 RGL. Their conclusion was that many recruits read at a level well below the readability of the materials used in recruit training and daily job tasks.

Bowman and Kerr (2) found that a sample of 14,503 recruits who were tested in the early months of 1979 obtained a median RGL of 11.0 on comprehension with 1.1 percent scoring below the 4.0 RGL and 5.2 percent scoring below the 6.0 RGL. In a subsequent study (3), they found that 79,350 recruits who entered the Navy between June, 1980, and May, 1981, had a median RGL of 11.0 on comprehension. The percentage distribution of recruits by RGL showed that .7 percent scored below the 4.0 RGL and 4.3 percent scored below the 6.0 RGL.

Studies have shown that reading skills are strongly related to the success of Navy personnel. The readability levels of many training and job materials are highly demanding with respect to the skill levels required. Descriptive research data suggest that the reading comprehension levels of recruits declined between 1974-75 and 1979. More recent data indicate that the median RGL on comprehension has stabilized at approximately the 11th grade level.

Procedures

The monthly CMI reports on recruit characteristics and test performance were the source of the data utilized in this study. Data were obtained on 84,123 recruits who entered the Navy between June, 1981, and May, 1982. The variables on which data were obtained directly from the reports were years of education, high school graduation status, aptitude test scores, and reading grade level scores. An additional variable, month of entry into the Navy, was defined by the month for which each report was prepared.

The two tests from which data were reported were the Gates-MacGinitie Reading Comprehension Test (8) and the Armed Services Vocational Aptitude Battery (10). The Gates, Level D, is currently used as a screening instrument with all recruits who enter the Navy. A new policy that will be implemented in the near future specifies the use of Levels D, E, and F, depending on the estimated reading skill level of the recruit. The recruits who score below the 6.0 RGL on the initial administration of the Gates are retested with an alternate form. (Only data from the first administration were used in this study.) Based on the results from the second administration of the Gates, the recruits who score between 4.0 and 6.0 RGL are assigned directly to ART. The recruits with RGL scores below 4.0 are referred to the Recruit Aptitude Board for a decision on assignment to ART or review by the Naval Aptitude Board.

The Armed Services Vocational Aptitude Battery (ASVAB) is administered to all recruits before they enlist in the Navy. The recruits who were in the sample had taken one of two series of ASVAB tests: Series 5-7 or Series 8-10. The aptitude score used in the study was the Armed Forces Qualification

Test (AFQT) score. The AFQT score is a percentile score that is derived from the word knowledge, numerical operations, and space perception subtests of ASVAB Series 5-7 and the word knowledge, paragraph comprehension, arithmetic reasoning and numerical operations subtests of ASVAB Series 8-10.

Descriptive data were obtained from the monthly CMI reports for means on years of education, AFQT scores of recruits classified by the 6.0 RGL criterion (above or below), and RGL scores. The median for RGL scores was derived for each month. Frequency distributions were compiled and percentage distributions were obtained for all recruits on RGL categories, high school graduation status, and combinations of the variables on high school graduation status and 6.0 RGL criterion. Proportions of high school graduate and non-high school graduate recruits who scored below the 6.0 RGL criterion were derived.

The means and medians were placed in a tabular format for presentation. The Chi-square procedure and confidence limits for proportions were used to perform analyses related to the hypotheses. The Chi-square technique provided comparisons of frequency distributions involving RGL scores, high school graduation status, and the 6.0 RGL criterion and high school graduation status by month of entry into the Navy. Confidence interval limits were calculated to compare the proportions of high school graduates and non-high school graduates who scored below the 6.0 RGL by composite group and month.

Results

The data that were compiled and analyzed are presented in a set of tables. The descriptive data are reported in the first three tables. The remainder of the tables contain the data and inferential analytic results related to the hypotheses.

Descriptive Data

The means on years of education by month of entry into the Navy are shown in Table 1. The composite mean for the twelve-month period was 11.6 years of education. The range of the monthly means was from 11.4 years to 11.7 years. Although the means were relatively consistent across the twelve months, a slight trend toward lower means was observed during the last three months - the period immediately preceeding the Spring high school graduation time.

Table 2 contains the means on the AFQT percentile scores for recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The data revealed that the means were 33.1 for all recruits who scored below the 6.0 RGL criterion and 58.0 for all recruits who scored above the 6.0 RGL criterion. Among the recruits who had RGL scores below 6.0, the monthly means varied from a low of 30.3 in November, 1981, to a high of 36.5 in April, 1982. Among the recruits with RGL scores above 6.0, the means ranged from 56.0 in July, 1981, to 59.8 in January and May, 1982. The difference in the overall means for the low and high RGL groups was approximately 25 percentile points. The differences by month are reasonably stable for the twelve month period. The observed differences suggest that the two RGL groups are relatively distinct with respect to aptitude as measured by the AFQT scores.

TABLE 1

MEANS ON YEARS OF EDUCATION FOR RECRUITS BY MONTH OF ENTRY

Month	N	Mean
June, 1981	8,926	11.7
July, 1981	9,100	11.7
August, 1981	8,193	11.7
September, 1981	11,972	11.7
October, 1981	7,360	11.6
November, 1981	6,482	11.6
December, 1981	4,943	11.7
January, 1982	4,964	11.7
February, 1982	4,553	11.7
March, 1982	5,968	11.6
April, 1982	5,385	11.5
May, 1982	6,277	11.4
TOTAL	84,123	11.6

TABLE 2

MEANS ON THE ARMED FORCES QUALIFICATION TEST SCORES FOR RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion			
	Below 6.0		Above 6.0	
	N	Mean	N	Mean
June, 1981	323	34.7	8,603	56.9
July, 1981	282	32.4	8,818	56.0
August, 1981	325	32.0	7,868	56.8
September, 1981	440	32.7	11,532	57.5
October, 1981	299	30.9	7,061	57.6
November, 1981	226	30.3	6,256	57.6
December, 1981	173	31.7	4,770	59.2
January, 1982	192	32.6	4.772	59.8
February, 1982	183	34.8	4,370	59.4
March, 1982	178	34.6	5,790	59.3
April, 1982	189	36.5	5,196	59.2
May, 1982	251	35.8	6,026	59.8
TOTAL	3,061	33.1	81,062	58.0

The medians and means on RGL for recruits by month of entry into the Navy are depicted in Table 3. The median for the composite group was 11.2 RGL while the mean was 9.9 RGL. The medians by month ranged from 11.0 RGL in February, 1982, to 11.6 RGL in September, 1981. The monthly means varied from a low of 9.7 RGL in February, 1982, to a high of 10.0 RGL in June, 1981. With the exception of the median in September, 1981, the measures of central tendency were largely stable across the twelve-month period. The relative magnitudes of the medians and means reflect negative skewness that is a result of high performance by many recruits on a test with norms ranging from 2.4 RGL to 12.5 RGL.

Hypothesis 1

There are no differences in the distributions of recruits classified by RGL category and month of entry into the Navy. The frequency and percentage distributions of recruits by RGL category and month of entry are reported in Table 4. The data for the composite group across the twelve-month period showed that 3.64 percent of the recruits scored below 6.0 RGL - the criterion for referral to ART. The percentages of recruits who had RGL scores below 6.0 were reasonably consistent by month as evidenced by a range from 2.98 percent in March, 1982, to 4.06 percent in October, 1981. The percentages of recruits who scored at or below 8.0 RGL was 17.52 percent for the year with a monthly low of 15.98 percent in June, 1981, and a high of 20.08 percent in February 1982. Within the 8.1-10.0 and 10.1-12.0 RGL categories, the percentages of recruits remained relatively constant throughout the twelve-month period. The percentages of recruits who scored above 12.0 RGL constituted a generally smaller percentage of the monthly totals after the first four months of the period. The Chi-square analysis of RGL distributions of recruits by month revealed highly significantly differences across the twelve months; therefore, the null hypothesis was rejected at the .05 level.

Hypothesis 2

There is no difference in the distribution of recruits classified by high school graduation status and month of entry into the Navy. Table 5 contains the frequency and percentage distributions of recruits by high school graduation status and month of entry. Based on the data for the total group, almost 77 percent of the recruits were high school graduates. The monthly percentages revealed considered variability from a high of 81.24 percent in July, 1981, to a low of 65.99 percent in May, 1982. After a moderate increase in percentages from June, 1981, for the three-month period of July-September, 1981, the percentages of high school graduates receeded to slightly below the annual percentage and remained relatively constant during the next five-month period. A decline in percentages occurred each month over the last three months of the period. The comparison of the frequency distributions of recruits on high school graduation status by month of entry using the Chi-square procedure indicated that the distributions differed to a highly significant degree at the .05 level. Consequently, the null hypothesis on distributions of recruits by high school graduation status and month of entry was rejected.

TABLE 3

MEDIANS AND MEANS ON READING GRADE LEVEL FOR RECRUITS
BY MONTH OF ENTRY

Month	N	Median	Mean
June, 1981	8,926	11.1	10.0
July, 1981	9,100	11.1	9.9
August, 1981	8,193	11.3	9.8
September, 1981	11,972	11.6	9.9
October, 1981	7,360	11.1	9.8
November, 1981	6,482	11.2	9.9
December, 1981	4,943	11.1	9.9
January, 1982	4,964	11.1	9.8
February, 1982	4,553	11.0	9.7
March, 1982	5,968	11.1	9.9
April, 1982	5,385	11.1	9.8
May, 1982	6,277	11.1	9.8
TOTAL	84,123	11.2	9.9

TABLE 4

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY READING GRADE LEVEL AND MONTH OF ENTRY

Month	Reading Grade Level Category																Total
	Below 3.0		3.0-3.9		4.0-6.0		6.1-8.0		8.1-10.0		10.1-12.0		above 12.0				
	f	%	f	%	f	%	f	%	f	%	f	%	f	%			f
June, 1981	12	.13	31	.35	280	3.14	1,103	12.36	1,445	16.19	2,589	29.01	3,466	38.83			8,926
July, 1981	9	.10	31	.34	242	2.66	1,229	13.51	1,442	15.85	2,558	28.11	3,589	39.44			9,100
August, 1981	10	.12	36	.44	279	3.41	988	12.06	1,272	15.53	2,079	25.38	3,529	43.07			8,193
September, 1981	19	.16	41	.34	380	3.17	1,495	12.49	1,856	15.50	3,176	26.53	5,005	41.81			11,972
October, 1981	5	.07	34	.46	260	3.53	1,091	14.82	1,270	17.26	2,070	28.13	2,630	35.73			7,360
November, 1981	3	.05	24	.37	199	3.07	927	14.30	1,139	17.57	1,876	28.94	2,314	35.70			6,482
December, 1981	7	.14	23	.47	143	2.89	752	15.21	834	16.87	1,454	29.42	1,730	35.00			4.943
January, 1982	6	.12	14	.28	172	3.46	736	14.83	869	17.51	1,392	28.04	1,775	35.76			4.964
February, 1982	5	.11	21	.46	157	3.45	731	16.06	802	17.61	1,313	28.84	1,524	33.47			4,553
March, 1982	8	.13	16	.27	154	2.58	881	14.76	1,075	18.01	1,724	28.89	2,110	35.36			5,968
April, 1982	6	.11	21	.39	162	3.01	836	15.52	972	18.05	1,565	29.06	1,823	33.85			5,385
May, 1982	12	.19	24	.38	215	3.43	911	14.51	1,125	17.92	1,809	28.82	2,181	34.75			6,277
TOTAL	102	.12	316	.38	2,643	3.14	11,680	13.88	14,101	16.76	23,605	28.06	31,676	37.65			84,123

Chi-square = 454.752 (Chi-square = 85.82, df = 66, level of significance = .05)

TABLE 5

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

Month	High School Graduate: Yes f	Yes %	No f	No %	Total f
June, 1981	6,840	77.57	1,978	22.43	8,818
July, 1981	7,239	81.24	1,672	18.76	8,911
August, 1981	6,526	81.19	1,512	18.81	8,038
September, 1981	9.435	81.08	2,202	18.92	11,637
October, 1981	5,432	75.99	1,716	24.01	7,148
November, 1981	4,776	75.43	1,556	24.57	6,332
December, 1981	3,626	76.18	1,134	23.82	4,760
January, 1982	3,778	78.22	1,052	21.78	4,830
February, 1982	3,399	76.61	1,038	23.39	4.437
March, 1982	4.217	72.31	1,615	27.69	5,832
April, 1982	3.718	70.86	1,529	29.14	5.247
May, 1982	4,012	65.99	2,068	34.01	6.080
TOTAL	62,998	76.76	19,072	23.24	82,070

Chi-square = 891.327 (Chi-square = 19.68, df = 11, level of significance = .05)

Hypothesis 3

There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The frequency and percentage distributions are presented in Table 6 for high school graduate recruits by the 6.0 RGL criterion and month of entry into the Navy. The data for the total group indicated that 3.75 percent of the high school graduate recruits obtained scores below 6.0 RGL on comprehension. The percentages by month ranged from 3.06 percent in March, 1982, to 4.44 percent in October, 1981. The monthly percentages did not reveal any consistent trend of increases or decreases in the percentages. The Chi-square comparison of the frequency distributions for high school graduate recruits by the 6.0 RGL criterion and month of entry showed that they differed significantly at the .05 level. The null hypothesis of no difference in the distributions was rejected.

Hypothesis 4

There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. Table 7 reports the frequency and percentage distributions of non-high school graduates by the 6.0 RGL criterion and month of entry into the Navy. Among the composite group, 2.83 percent of the recruits who were not high school graduates scored below the 6.0 RGL on comprehension. Across the twelve-month period, the percentages varied from 1.67 percent in November, 1981, to 3.79 percent in June, 1981. The percentages by month tended to be higher at the beginning and end of the period. The results of the Chi-square comparison of the frequency distributions of non-high school graduates by the 6.0 RGL criterion and month of entry using the .05 level of significance indicated that they differed. The null hypothesis that the distributions are not different was rejected.

Hypothesis 5

There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions are depicted in Table 8 for the recruits who scored below 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data showed that 81.41 percent of the recruits who obtained scores below 6.0 RGL on comprehension were high school graduates. The percentages by month revealed a range from a low of 70.13 percent in May, 1982, to a high of 87.85 percent in November, 1981. The percentages were relatively higher during the months of July, 1981 - February, 1982 with a decline occurring during the last three months of the period. The Chi-square comparison of the frequency distributions of recruits scoring below 6.0 RGL classified by high school graduation status and month of entry revealed a significant difference at the .05 level. The null hypothesis of no difference in the distributions was rejected.

Hypothesis 6

There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

TABLE 6

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF HIGH SCHOOL GRADUATE RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion: Below 6.0 f	Below 6.0 %	Above 6.0 f	Above 6.0 %	Total f
June, 1981	238	3.48	6,602	96.52	6,840
July, 1981	234	3.23	7,005	96.77	7,239
August, 1981	268	4.11	6,258	95.89	6,526
September, 1981	353	3.74	9,082	96.26	9,435
October, 1981	241	4.44	5,191	95.56	5,432
November, 1981	188	3.94	4,588	96.06	4,776
December, 1981	125	3.45	3,501	96.55	3,626
January, 1982	156	4.13	3,622	95.87	3,778
February, 1982	141	4.15	3,258	95.85	3,399
March, 1982	129	3.06	4,088	96.94	4,217
April, 1982	130	3.50	3,588	96.50	3,718
May, 1982	162	4.04	3,850	95.96	4.012
TOTAL	2,365	3.75	60,633	96.25	62,998

Chi-square = 27.988 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 7

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF NON-HIGH SCHOOL GRADUATE RECRUITS BY SIXTH GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
Month	Below 6.0 f	%	Above 6.0 f	%	Total f
June, 1981	75	3.79	1,903	96.21	1,978
July, 1981	38	2.27	1,634	97.73	1,672
August, 1981	49	3.24	1,463	96.76	1,512
September, 1981	67	3.04	2,135	96.96	2,202
October, 1981	47	2.74	1,669	97.26	1,716
November, 1981	26	1.67	1,530	98.33	1,556
December, 1981	32	2.82	1,102	97.18	1,134
January, 1982	27	2.57	1,025	97.43	1,052
February, 1982	29	2.79	1,009	97,21	1,038
March, 1982	37	2.29	1,578	97.71	1,615
April, 1982	44	2.88	1,485	97.12	1,529
May, 1982	69	3.34	1,999	96.66	2,068
TOTAL	540	2.83	18,532	97.17	19,072

Chi-square = 21.017 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 8

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

Month	High School Graduate				Total
	Yes		No		
	f	%	f	%	f
June, 1981	238	76.04	75	23.96	313
July, 1981	234	86.03	38	13.97	272
August, 1981	268	84.54	49	15.46	317
September, 1981	353	84.05	67	15.95	420
October, 1981	241	83.68	47	16.32	288
November, 1981	188	87.85	26	12.15	214
December, 1981	125	79.62	32	20.38	157
January, 1982	156	85.25	27	14.75	183
February, 1982	141	82.94	29	17.06	170
March, 1982	129	77.71	37	22.29	166
April, 1982	130	74.71	44	25.29	174
May, 1982	162	70.13	69	29.87	231
TOTAL	2,365	81.41	540	18.59	2,905

Chi-square = 49.188 (Chi-square = 19.68, df = 11, level of significance = .05)

Table 9 presents the proportions of recruits scoring below the 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data on the percentages/proportions of recruits who scored below 6.0 RGL are discussed above for high school graduates and non-high school graduates separately. A review of the relative proportions of the two groups showed that a higher proportion (.0083) of the high school graduates than non-high school graduates scored below the 6.0 RGL criterion for the twelve-month period and eleven of the twelve months (except for June, 1981). The confidence limits comparing the difference in proportions for the composite groups indicated that the overall proportions differed significantly at the .05 level because the limits did not include 0 within the range. The proportions also differed significantly for five of the twelve months. In all cases where significant differences existed, the proportions were higher for the high school graduates than the corresponding proportions for the non-high school graduates. Based on the comparison of the two composite groups, the null hypothesis of no difference in the proportions was rejected.

Conclusions

The data utilized in this study provide information on selected variables that describe the Navy's recruit population using a sample of recruits for a one-year period. The conclusions are based on the descriptive analyses and the results of testing specific hypotheses concerning the data.

With respect to years of education, Navy recruits have completed slightly more than half of the eleventh grade on the average. Three-fourths are high school graduates. The negative skewness implied by the data on mean years of education and high school graduation status indicates that many recruits terminate their education when they graduate from high school. The inferential analysis shows that higher percentages of the recruits who enter the Navy during the summer months are high school graduates than in the other months of the year. This phenomenon is expected in the months following the traditional high school graduation time of the year.

The aptitude of recruits as shown by AFQT means does not appear to vary in any clearly identifiable seasonal or cyclic pattern. The means indicate, however, that recruits who score above the 6.0 RGL criterion have greater aptitude than recruits who score below the 6.0 RGL criterion. The difference in aptitude score means for the two groups suggests that the populations are essentially different.

The performance of the recruits on reading comprehension shows relative stability across the twelve-month period with regard to descriptive measures of central tendency. The median for the RGL places the composite group in the early part of the eleventh grade while the mean for the RGL is equivalent to the end of the ninth grade. The median RGL is only slightly higher than the median reported for the recruit population in 1980-81 by Bowman and Kerr (3). The frequency distributions of recruits by RGL categories, however, reveal differences in the composition of the recruit groups from month to month.

Separate analyses of the distributions of high school graduate and non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy indicate that differences exist across the

TABLE 9

COMPARISON OF PROPORTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

Month	High School Graduate: Yes N	Yes p	No N	No p	Confidence Limits .025 to .975
June, 1981	6,840	.0348	1,978	.0379	-.0126 to .0064
July, 1981	7,239	.0323	1,672	.0227	.0014 to .0178
August, 1981	6,526	.0411	1,512	.0324	-.0014 to .0188
September, 1981	9,435	.0374	2,202	.0304	-.0011 to .0151
October, 1981	5,432	.0444	1,716	.0274	.0075 to .0265
November, 1981	4,776	.0394	1,556	.0167	.0143 to .0311
December, 1981	3,626	.0345	1,134	.0282	-.0050 to .0176
January, 1982	3,778	.0413	1,052	.0257	.0041 to .0271
February, 1982	3,399	.0415	1,038	.0279	.0015 to .0257
March, 1982	4,217	.0306	1,615	.0229	-.0013 to .0167
April, 1982	3,718	.0350	1,529	.0288	-.0041 to .0165
May, 1982	4,012	.0404	2,068	.0334	-.0026 to .0166
TOTAL	62,998	.0375	19,072	.0283	.0064 to .0120

twelve-month period within each group. Among the high school graduates, the distributions do not reflect any perceptible trend. The distributions of non-high school graduates show that higher percentages tend to score below the 6.0 RGL criterion in the early and later months of the period.

The comparison of recruits who obtain RGL scores below 6.0 classified by high school graduation status and month of entry into the Navy reveals that differences in distributions occur during the twelve-month period. Higher percentages of the recruits who score below 6.0 RGL are high school graduates in the months between mid-summer and mid-winter. A higher proportion of the composite groups of high school graduate recruits than non-high school graduate recruits score below the 6.0 RGL. The differences are significant for the composite groups and for the recruits in five of the twelve months.

A disparity exists between the proportion of high school graduates among the recruits who obtain RGL scores below 6.0 (four-fifths) and the proportion of all recruits who are high school graduates (three-fourths). If the proportion of high school graduates among the recruits with RGL scores below 6.0 had been the same as the proportion of high school graduates among all recruits, 135 fewer high school graduate recruits would have scored below the 6.0 RGL. In addition, the percentage of high school graduate recruits scoring below 6.0 RGL is .92 percent higher than the percentage for non-high school graduates. If the percentage for high school graduates had been the same as the percentage for non-high school graduates, 582 fewer recruits would have scored below the 6.0 RGL.

The conclusions suggest that the recruit population remains relatively stable with respect to central tendency measures on selected descriptive variables: years of education, reading comprehension performance, and aptitude indices. Variability across the twelve-month period is apparent on several variables. Factors on which distributions by month differ include RGL scores, high school graduation status, high school graduate and non-high school graduate recruits who score above and below the 6.0 RGL criterion, and high school graduation status of recruits who score below the 6.0 RGL. The proportion of recruits who obtain RGL scores below 6.0 is higher for the high school graduates than for the non-high school graduates.

This study indicates that the recruits who enter the Navy will probably vary at different times of the year on some important characteristics. Consequently, ART management personnel can expect that the program resource requirements will be greater at some times of the year than at other times. By anticipating the variability in demands, more efficient utilization of resources could be achieved. The study demonstrates that data provided by routine monthly CMI reports on Navy recruit characteristics could be used effectively to improve program management. Constant monitoring of the reports and elementary analyses of the data would enable the staff to anticipate fluctuations in the flow of students into the ART program.

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